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Yield formation of PVY-resistant and susceptible potato breeding lines

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Abstract

We studied the resistance to potato virus Y (PVY) in a potato hybrid population, and its effect on the yield formation under contrasting meteorological conditions. The virus resistance analysis was conducted after growing the plants under natural virus infection and after PVY inoculation. The dominant Ryadg gene allele in the potato breeding lines genotypes was revealed by detection of the PCR-based molecular marker RYSC3. Virus resistant lines were selected more often in the potato breeding program than susceptible forms due to higher productivity and larger number of tubers. PVY-resistant samples demonstrated a higher yield than susceptible forms. Significant differences ($p < 0.05$) were detected by univariate ANOVA in three of the four years studied. The virus resistance effect value ranged from 4 to 22%. Resistant form yield was more stable than that of susceptible one, which was evident from the corresponding coefficients of variation. Resistant samples also had a greater number of tubers per plant. At the same time, univariate ANOVA revealed significant differences ($p < 0.05$) only in one of the four studied years. The virus resistance effect ranged from 2 to 22%.

Keywords

ANOVA, Breeding lines, Potato, Potato virus Y, Resistance, Yield